Sub C1

50. The method of claim 49, wherein the mixture of oxide and carbon sources are selected from the group consisting of polymeric precursors, alkoxysilane, silicon alkoxide, methyldimethoxysilane (MDMS), and tetraethoxysilane (TEOS).

51. The method of claim 49, wherein transforming the mixture of oxide and carbon sources includes removing an excess portion of the silicon oxycarbide by chemical mechanical polishing (CMP) to obtain a desired thickness of the silicon oxycarbide.

a2

52. The method of claim 49, wherein transforming includes hydrolyzing the mixture in the presence of an acid.

53. The method of claim 49, wherein transforming includes pyrolyzing the mixture.

Sub B2

54. A method, comprising:

providing a plurality of circuit elements on a substrate;

coating at least a portion of a surface of the substrate with a mixture of oxide and carbon sources;

transforming the mixture of oxide and carbon sources into a first porous oxycarbide glass dielectric layer on the integrated circuit and insulating first and second of the plurality of circuit elements from each other, the first porous oxycarbide glass dielectric layer having uniformly distributed voids that have an approximate diameter between 20 angstroms and 300 angstroms;

selectively forming vias in the first porous oxycarbide glass dielectric layer for providing connection to the first and second circuit elements;

forming metal layers in the vias and elsewhere on a working surface of the substrate;

patterning and etching the metal layers to provide desired interconnection between the first and second circuit elements and other circuit elements or interconnection lines;

coating at least a portion of a surface of a substrate with a mixture of oxide and carbon sources; and

transforming the mixture of oxide and carbon sources into a second porous oxycarbide glass dielectric layer on the integrated circuit.

Sub B3 cont

55. The method of claim 54, wherein the second porous oxycarbide glass dielectric layer has a dielectric constant less than approximately 2.0.

Sub C1

56. The method of claim 55, wherein the second porous oxycarbide glass dielectric layer has uniformly distributed voids that have an approximate diameter between 20 angstroms and 300 angstroms.

A2

57. The method of claim 54, wherein the second porous oxycarbide glass dielectric layer has uniformly distributed voids that have an approximate diameter between 20 angstroms and 300 angstroms.

58. The method of claim 54, wherein the first porous oxycarbide glass dielectric layer has a dielectric constant less than approximately 2.0.

Sub B3

59. A method, comprising:

forming a plurality of circuit elements on a substrate;

coating at least a portion of a surface of the substrate and at least one of the plurality of circuit elements with a mixture of oxide and carbon sources; and

transforming the mixture of oxide and carbon sources into a silicon oxycarbide having uniformly distributed voids that have an approximate diameter between 20 angstroms and 300 angstroms.

Sub C1

60. The method of claim 59 wherein the mixture of oxide and carbon sources are selected from the group consisting of polymeric precursors, alkoxysilane, silicon alkoxide, methyldimethoxysilane (MDMS), and tetraethoxysilane (TEOS).

61. The method of claim 59, wherein transforming the mixture of oxide and carbon sources includes removing an excess portion of the silicon oxycarbide by chemical mechanical polishing (CMP) to obtain a desired thickness of the silicon oxycarbide.

62. The method of claim 59, wherein transforming includes hydrolyzing the mixture in the presence of an acid.

63. The method of claim 59, wherein transforming includes pyrolyzing the mixture.

a2

64. A method, comprising:

forming a plurality of circuit elements on a substrate;

coating at least a portion of a surface of the substrate and at least one of the plurality of circuit elements with a mixture of oxide and carbon sources; and

transforming the mixture of oxide and carbon sources into a silicon oxycarbide having uniformly distributed voids that have an approximate diameter of 30 angstroms.

65. The method of claim 64, wherein the mixture of oxide and carbon sources are selected from the group consisting of polymeric precursors, alkoxysilane, silicon alkoxide, methyldimethoxysilane (MDMS), and tetraethoxysilane (TEOS).

66. The method of claim 64, wherein transforming the mixture of oxide and carbon sources includes removing an excess portion of the silicon oxycarbide by chemical mechanical polishing (CMP) to obtain a desired thickness of the silicon oxycarbide.

67. The method of claim 64, wherein transforming includes hydrolyzing the mixture in the presence of an acid.

68. The method of claim 64, wherein transforming includes pyrolyzing the mixture.

69. A method, comprising:

forming a plurality of circuit elements on a substrate;

coating at least a portion of a surface of the substrate and at least one of the plurality of circuit elements with a mixture of oxide and carbon sources; and

transforming the mixture of oxide and carbon sources into a silicon oxycarbide having

uniformly distributed voids that have an approximate diameter of 200 angstroms.

Sub C1

A2

70. The method of claim 69, wherein the mixture of oxide and carbon sources are selected from the group consisting of polymeric precursors, alkoxysilane, silicon alkoxide, methyldimethoxysilane (MDMS), and tetraethoxysilane (TEOS).

71. The method of claim 69, wherein transforming the mixture of oxide and carbon sources includes removing an excess portion of the silicon oxycarbide by chemical mechanical polishing (CMP) to obtain a desired thickness of the silicon oxycarbide.

72. The method of claim 69, wherein transforming includes hydrolyzing the mixture in the presence of an acid.

73. The method of claim 69, wherein transforming includes pyrolyzing the mixture.

Sub B5

74. A method of forming a silicon oxycarbide layer having uniformly distributed voids that have an approximate diameter between 20 angstroms and 300 angstroms on a substrate, comprising:

coating at least a portion the substrate with a mixture of oxide and carbon; and

transforming the mixture of oxide and carbon sources into the silicon oxycarbide layer.

75. The method of claim 74, wherein coating at least a portion of the substrate includes coating at least one circuit element on the substrate.

76. The method of claim 74, wherein coating at least a portion of the substrate includes coating a plurality of circuit elements on the substrate.

Sub C1

77. A method, comprising:

coating at least a portion of a surface of the substrate with a mixture of oxide and carbon sources; and

transforming the mixture of oxide and carbon sources into a silicon oxycarbide having uniformly distributed voids that have an approximate diameter between 20 angstroms and 300 angstroms and which has a dielectric constant less than approximately 2.0.

a2 Concl'd

78. A method, comprising:

coating at least a portion of a surface of the substrate with a mixture of oxide and carbon sources; and

transforming the mixture of oxide and carbon sources into a silicon oxycarbide having uniformly distributed voids that have an approximate diameter between 20 angstroms and 300 angstroms.

79. A method, comprising:

coating at least a portion of a surface of the substrate with a mixture of oxide and carbon sources; and

transforming the mixture of oxide and carbon sources into a silicon oxycarbide having uniformly distributed voids that have an approximate diameter of 30 angstroms.

80. A method, comprising:

coating at least a portion of a surface of the substrate with a mixture of oxide and carbon sources; and

transforming the mixture of oxide and carbon sources into a silicon oxycarbide having uniformly distributed voids that have an approximate diameter of 200 angstroms.